

REMARKS

Claims 1, 2, 5, 7-17, 19 and 20 are active in the case. Reconsideration of this application is requested.

The present invention relates to an element for a line system that is a part of a fuel cell.

Claim Amendments

Claim 1 has been amended by specifying that the fuel that is conveyed through the line system of a fuel cell and which makes contact with innermost layer I is hydrogen or methanol. This limitation is supported by the disclosure of the specification at page 1, lines 21-22. Accordingly, amended Claim 1 is of narrower scope than previously active Claim 1, because the scope of the fuel that contacts the innermost layer material is limited to only two fuels. No new matter has been introduced into the claims as a result of the amendment that has been made. Entry of the amendments is respectfully requested.

Claim Objections

The objection that has been raised with respect to Claims 1, 2, 5, 7-17, 19 and 20 is obviated by the amendment made to each of Claims 1, 5 and 7. Withdrawal of the objection is respectfully requested.

Invention

The present invention is directed to a component of a line system of a fuel cell, comprising: a) an innermost layer I, which is in contact exclusively with the hydrogen or methanol fluid that is conveyed through the line system and is comprised of a polyester

molding composition that contains at least a conductivity increasing additive, and, b) a layer II comprised of a polyamide molding composition that contains an effective impact modifying amount of EPM or EPDM rubber each of which contains maleic anhydride groups grafted thereon, and at least one other layer which is selected from the group consisting of i) a layer III comprised of a molding composition comprised of a functionalized polyolefin, and ii) a layer IV comprised of a polyolefin molding composition in which the polyolefin is not functionalized, and iii) a layer V comprised of an EVOH molding composition. The polyester molding composition is such that when a fluid comprising water is passed over the innermost polyester layer, the conductivity at 90° C increases only by a maximum of 100 µS/cm or wherein the polyester molding composition of layer I is such that when a fluid comprising water and methanol is passed over the innermost polyester layer, the conductivity at 90° C increases only by a maximum of 80 µS/cm. The line system of the present invention provides a fuel cell system that entirely eliminates or permits the leaching of components from the line system that can react with the electrolyte or with the anode material of the cell which would poison the catalyst of the fuel cell or which would cause undesired polarization of the cell.

Prior Art Rejection

Claims 1-7, 9-12, 15 and 18-20 stand rejected based on 35 USC 102(b) as anticipated by Ries, U. S. Patent 5,798,048. This ground of rejection is respectfully traversed.

The Ries patent discloses a plastic fuel filter that has antistatic properties wherein the housing of the fuel filter is comprised of a layered structure of a conductive inner layer and a conductive outer layer (both layers Component A) of a first plastic and a non-conductive middle layer (Component B) of a second plastic. Various types of electrically conductive additives and amounts thereof for incorporation in the polyester layer are described at the top

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of column 7. Column 3, lines 43 to 51 teaches that suitable component A materials include polyamides, polyolefins and thermoplastic polyesters and polyester elastomers. Suitable component B materials include polyamides, polyolefins, thermoplastic polyesters, fluoropolymers and EVOH. However, it is clear from the disclosure in the summary of the invention of column 2 of the patent that whatever laminated structure is desired such as a A/B/A or A/B/A/B/A structure, both the inner and outer layers A are formed of the same plastic (a first plastic) and contain a conductive material, while layer B is formed of a different or second plastic and is not conductive. Thus, column 6 describes examples of layered products which are a A/B/A structure and a A/B/A/B/A structure. In both products, the A plastic material is a polyamide selected from the group of PA 6, PA 66, PA 11 and PA 12 while plastic B is modified PVDF, another fluoropolymer, polybutylene terephthalate, EVOH or the like. However, there is no teaching or suggestion anywhere in the patent of forming an inner conductive layer from one type of thermoplastic such as a polyester followed by an outer layer of an entirely different polymer such as a polyamide. Moreover, the scope of the patent is limited to the motor vehicle sector and the contact of fuel lines with a motor fuel (hydrocarbon), such as diesel fuel or gasoline, that is modified with an additive such as methanol (col 7, lines 39-44). There is no teaching or suggestion of a fuel line system that is exclusively exposed to only hydrogen or methanol.

Applicants also maintain that another distinguishing feature of the invention is a fuel line system of an inner polyester layer whose conductivity is modified to the specific extent set forth in present Claim 1 in terms such that when a fluid comprising water is passed over the innermost polyester layer, the conductivity at 90° C increases only by a maximum of 100 µS/cm or that when a fluid comprising water and methanol is passed over the innermost polyester layer, the conductivity at 90° C increases only by a maximum of 80 µS/cm.

Accordingly, the patent neither anticipates nor obviates the invention as claimed and withdrawal of the rejection is respectfully requested.

Claims 1-12 stand rejected based on 35 USC 102(b) as anticipated by Boer et al, U. S. Patent 6,355,358. This ground of rejection is respectfully traversed.

As stated previously, the Boer et al patent discloses a multi-layer composite that can be used in the fabrication of such devices as pipes, filler necks and tanks, in particular for the transport or storage of (hydrocarbon) liquids or gases. There is no teaching or suggestion of a fuel line system that is exclusively exposed to only hydrogen or methanol.

In an embodiment of the invention, the patent teaches the combination of layers I and II, each of which is formulated of a thermoplastic molding composition, wherein layer I is a polyamide and layer II is a polyester (columns 5 and 6). However, the emphasis of the patent is on a so-called adhesion promoter layer which is a particular graft copolymer, an embodiment of which is described at the top of column 8 of the patent. Here, a four-component embodiment is described, wherein component four is described as an impact-modifying rubber, as noted by the Examiner in his discussion on page 4 of the Official Action. The adhesion promoter is positioned between layers I and II. However, the patent nowhere teaches the line system of the present invention, in which the polyester layer, in particular, as an inner layer, is provided with a stated electrical conductivity. These deficiencies on the part of the patent are important, because a clear distinction between the present invention and the description of the patent exists. Accordingly, the patent does not anticipate the present invention as claimed and withdrawal of the rejection is respectfully requested.

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It is submitted that this application is in condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,

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